

Project Scope-Geophysics

- Bedrock at the site is shallow, thereby limiting the use of Cone Penetrometry (CPT)?
- Sequence of this investigation will be Geophysical investigation and Potholing, followed by CPT.
- Geophysical investigation will begin on September 14, 2015 and run for two weeks max.
- This will investigate the seeping petroleum sludges downhill from the bermed and apparent source areas as far as it can be followed, using the EM-31 to determine the signature of the petroleum sludge. If this works, each bermed location will be investigated to determine whether there are other below ground seeps not yet identified.
- GPR will be used to map the bedrock surface. No seismic studies are planned at this time.
- Site mobilization and equipment/jobsite requirements were identified.
- Williams has a pipeline across the property. They must be notified and identify the location of the line.
- Subsurface pipelines and structures, concrete, tanks, etc. will be identified, geolocated and marked, then added to the site drawing.

Goals include:

Wilcox Refinery

- Clear for subsurface utilities and structures.
- Find signature for petroleum sludge flows.
- Check for additional flows/plumes.

Lorraine Refinery

- Clear and grub if/as necessary.
- Clear property for underground obstructions.

Wilcox Tank Farm

- Try the Electromagnetic (EM)-31 and ground penetrating radar (GPR) but these may not work here.
- Pothole as necessary to determine whether sludge flows are present.
- Scope out the potential for the use of CPT later based on findings. Also possibly membrane interface probe (MIP) and Geoprobe.

LIF work

The most important issue is pathways to the creek and contamination in the creek.

Priorities:

1. Where are the pathways and are they still active?
 - a. Walk the creek line and look for surface water pathways or seep pathways. Then use CPT to investigate those areas.
 - b. Area of catastrophic release by surface water from berm that was broken.
2. Tank farm investigation – Define the tank farm area. Show that there is exposure or risk to properties from tank farm.
3. Where is the LNAPL still on site (horizontal and vertical extents)? Primarily in the area of the Church's Well (Lorraine Property).
4. If seeps are found, investigate by Geoprobe and by CPT/ROST.
5. South to North on Wilcox property. Perimeter sampling around operations areas. Where contaminant types match, preliminary pathways can be theorized.
6. North of Refinery Road and two suspect tanks (far eastern end of property) are last priorities, optional if time permits.

QAPP project objectives and questions summarized 4-29-16
(reference QAPP Wilcox Oil Company, Revision 1, 11-24-16)

In a previous mobilization, SERAS personnel conducted a geophysical survey of the site to locate abandoned underground oil tanks and piping within the limits of the Wilcox Oil Company Superfund Site. In addition, the bedrock underlying the tank farm was mapped to show depth to bedrock and potential pathways of migration for contaminants. SERAS personnel have now been tasked with investigating the site using in-situ methods such as CPT and ROST using laser induced fluoroscopy (LIF), as well as more conventional methods such as direct sampling using direct push technology (DPT) such as Geoprobe™ with conventional sampling. Field XRF will also be used to help guide the sampling investigation. A conceptual site model (CSM) will be built to be able to conduct a more focused remedial investigation (RI) effort.

Problem Definition

Previously identified Project Questions:

- What is the bedrock topography?
- Are direct-push, direct-sensing technologies viable in this area?
- Does the bedrock topography create preferential pathways?
- What types of subsurface structures and utilities exist (i.e., foundations, piping, underground storage tanks (USTs))?

For this mobilization, there are several questions, depending on the area of the site.

Tank Farm Area

- What is the variety of waste streams found in the tank farm area?
- Are any of the waste streams of a leachable nature that could impact groundwater (GW) or nearby streams?
- What oil-related material was used to assist with the construction of the berms?
- What is the extent of the tarry waste?
- What wastes remain in the ponds?
- Is there risk to the public/environment from the contamination at this site?
- Do surface and/or subsurface migration pathways exist from the tank farm area to the creeks?

Refinery Areas (Wilcox Refinery [WR] Area and Lorraine Refinery [LR] Area)

- What are the variety of wastes remaining in the refinery area?
- Are there any additives remaining?
- Is there risk to the public/environment from the contamination at this site?
- Do surface and/or subsurface migration pathways exist from the refinery areas to the creeks?

Site Boundaries and Creeks

- Are site contaminants related to the oils and other wastes materials found in the creek nearby and/or downstream?

The possible classes of contaminants and the affected matrices:

Crude oil and possibly refinery products and intermediaries in soils and GW will be measured by gasoline range organics (GRO), diesel range organics (DRO) and oil range organics (ORO). Metals (including cyanide [CN] and mercury [Hg], volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and pesticides in soils and GW. Hexavalent chromium

(CrVI) and tetra-ethyl lead (TEL) will be analyzed in soils and GW based on field lead and chromium results. TEL is a direct additive to boost the octane rating of gasoline.